RESEARCH COMMUNICATION

Experience with a Self-Administered Device for Cervical Cancer Screening by Thai Women with Different Educational Backgrounds

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Abstract

Background: This descriptive study was carried out to test the acceptability of a self-administered device for cervical cancer screening and assess certain risk factors in relation to the cancer in two districts of Khon Kaen province in Northeast Thailand.

Methods: A total of 354 women from the villages were selected (including 143 teachers from secondary and primary schools; 24 health officers from the rural health centres, and 37 nurses from the University Hospital, Khon Kaen University). The Kato device was introduced and used by the women, who were then asked to give their opinion on its usage.

Results: The Kato device was generally well accepted by the women. However, many of those with a higher educational background were more sceptical towards the device than their counterparts from the villages.

Conclusions: A suitable approach to strengthen the control of cervical cancer in the rural areas of Thailand might be to introduce the Kato device as an integral part of primary health care. The introduction of the device should go along with health education on the importance of avoiding infection with the papilloma viruses. This message should be transmitted to both females and males.

Key Words: Cervical cancer - screening - self-administered device - Kato device - risk factors

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Introduction

Cervical cancer incidences are usually higher in Africa, Latin America and Asia compared with those of highly industrialised countries. Incidence of this cancer site in Thailand is with 23.4 to 100.000 even higher than in other countries in South and Southeast Asia (Ferlay et al, 1998). The most effective way of controlling cervical cancer at present is through secondary prevention. The rural areas of Thailand especially are still not adequately covered by mass screening programs through which cervical cancer could be detected and treated early, and by this, subsequently bring about a reduction in the mortality rate in the region.

The acceptance and feasibility of a self-administered device for cervical cancer screening of rural women in Northeast Thailand have already been tested previously (Pengsaa et al., 1997). The results obtained from testing the so-called Kato device (Noguchi et al., 1982) have been

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promising. The device was found to be suitable for mass screening campaigns. The objective of this study is to test the acceptability of the device in groups of females with different educational backgrounds and to assess some risk factors in connection with cervical cancer in the groups of females under survey.

Methods

A total of 354 women from the Khon Kaen province, in Northeast Thailand participated in the study. One hundred and fifty females from villages located in two sub-districts of the Chumpae district (Ban Na Nong Muang and Ban Nong Krong) and one sub-district of the Srichompu District (Non Han) were selected for the study. Staff from the health centres announced the provision of this service in the villages under their responsibility. The women in the villages were invited to visit a health centre close to their homes on a particular day. All those who turned up were included in the study.
Female teachers from five schools (two secondary and three primary schools) in the Chumpae district and two primary schools from the Srichompu district were invited to participate in the study. One hundred and forty three female teachers agreed to do so. The ratio of those who volunteered to participate in this survey to the overall number of female school teachers approached was approximately 1:3. Female health officers from health centres in the districts and nurses from the Srinakarin University Hospital from the Khon Kaen University were included also in the study. Approximately 60% of health officials from all health centres in the two districts co-operated, but only a few nurses could be recruited for the study.

All the villagers and teachers, as well as the health officials participating in the study were trained on the use of the self-administered device (Kato device) at the health centres. Most of the women from the villages used the device at the health centres. Those women who could not do so on that day, were allowed to take the device home and return it the next day. The teachers were instructed on the use of the device at their respective schools. They took the device home and mailed it back to the cancer centre of the university hospital in Khon Kaen afterwards. The head nurses of the university hospital of the Khon Kaen University were briefed on the use of the device. They were also asked to get their staff to co-operate in the study. The device was afterwards mailed back by those nurses from the cancer centre who participated in the study.

The survey was conducted in March 1997. The women were informed about the results of the screening afterwards. The Kato device consists of a sponge attached to the end of a rod and a small polyethylene container with 1 ml of 50% ethyl alcohol for fixation of the specimen. The rod is inserted into the vagina and rotated to absorb cells. Upon removal, it is put into a tube, which is provided with the device. The tube can then be sealed and collected. At the laboratory, the sponge applicator is removed and smeared evenly on a glass slide and then fixed in 90% ethyl alcohol and stained according to Papanicolau (Noguchi et al., 1982).

The smears were subsequently checked by experienced cytotechnologists from the cancer unit of the university hospital of the Faculty of Medicine, Khon Kaen University. For reporting the results, the World Health Organisation classification of tumours of the lower female genital tract was applied (WHO, 1988). For this communication, only benign changes being non-dysplastic and atypia cells due to some inflammation and abnormal cells with dysplasia, classified as mild-, moderate- and severe dysplasia are listed. Further details are not given in this communication.

After the females returned the Kato device to the project' s staff, they were interviewed by means of a closed questionnaire. The aim of the questionnaire was to obtain general information on their socio-economic status, particularly on their educational background. In order to assess some risk factors for cervical cancer, they were asked their age at the time of their first intercourse and their first pregnancy. They were asked also whether they believed their husbands have been going to commercial sex workers. The females were asked also to give their opinion on the Kato device for screening. The interviews were conducted by staff members experienced in fieldwork from the Faculty of Medicine and the Faculty of Public Health of the Khon Kaen University.

The data collected were combined into a DBASE file and finally transferred for statistical evaluation into the MINITAB program. The proportions of groups of females attributed to given categories were calculated. Often the number of individuals per cell was too small for a statistical evaluation of the data to be usually done. The groups of health officials and nurses were small. Results from both groups are nevertheless given since certain trends in the evaluation of the questionnaire could be observed. Percentage calculation for only one or two persons in a category was done, in order to get a uniform outlay of the tables. For the calculation of the median, the construction of the 95% confidence interval was based on order statistics. For testing differences between groups, the conventional Mann-Whitney test was applied.

The project was approved by the ethical commission of the Medical Faculty of the Khon Kaen University in Thailand.

Results

The two major groups of women participating in this study were from communities and schools in the rural areas of Northeast Thailand. About 40% of the women were villagers and an equal number were primary school teachers (Table 1). Less than 10% were female officials working in sub-district health centres and a similar proportion of participants were nurses. The median age between the four groups of women ranged between 39 to 43 years (Table 1). The median age between the four groups was not statistically significant.

Most of the women are married (Table 2). Health

Table 1. No. of Individuals in Each Group Investigated and Median Age (95% ACI*) per Group

Groups	Women		Age (years)**		
	N	%t	N	Median	95% ACI
Villagers	150	42.4	100	43	39.7-45.0
Officials in health station	24	6.8	9	41	34.7-46.3
School teachers	143	40.4	89	40	39.0-42.0
Nurses	37	10.4	34	39	38.0-41.1
Total	354	100.0	232	40	39.6-42.0

*95% ACI = 95% Achieved Confidence Interval ** No significant differences between groups

officials, school teachers and nurses were included in the study because their occupation is directly linked to their educational background, i.e. health officials will have received a college education and teachers as well as nurses will have at least a B.Sc. degree. The educational background only varies between the group of villagers (Table 2). Almost 70% of them have completed primary school and about 20% secondary school. More than 10% of the women in the villages did not finish any formal education.

Females in the villages tend to marry at an earlier age, thus having experienced their first intercourse around the age of 19 or 20 years, and having their first child one year later (Table 3). Females with a college or university education (represented here by teachers, health officials and nurses) seem to experience their first intercourse at a significantly older age as compared to the women from the villages (Table 3).

A rather high proportion of the rural village females, i.e. 24.6%, suspected their husbands of going to commercial sex workers, while the females with a distinct profession either denied or admitted that they were not aware of their husbands having any extramarital sexual contacts (Table 4). A high proportion of women have attended cervical cancer screening services before. A higher education seems to be associated with a higher proportion of women being aware of the benefits of cervical screening (Table 5). Only over 50% from the group of villagers, but 70% of health officials and almost 80% of teachers were screened for cervical

Table 2. Marital Status and Education

Status/level	Villagers		Health officials		Teachers		Nurses		Total	
	N	%	N	%	N	%	N	%	N	%
Marital status										
Single	3	2.0	0	0	4	2.8	6	16.2	13	3.7
Married	136	91.3	23	95.8	136	95.1	30	81.1	325	92.1
Separated etc	10	6.7	1	4.2	3	2.1	1	2.7	15	4.2
Total	149	100	24	100	143	100	37	100	353	100
Education										
Less primary school	17	11.3	0	0	0	0	0	0	17	4.8
Primary school	104	69.4	0	0	0	0	0	0	104	29.4
Secondary school	29	19.3	0	0	1	0.7	0	0	30	8.5
College	0	0	24	100	0	0	7	18.9	31	8.8
B.Sc. or higher grade	0	0	0	0	142	99.3	30	81.1	172	48.5
Total	150	100	24	100	143	100	37	100	354	100

Table 3. Age of First Intercourse and at First Pregnancy

Groups	Age (years) first intercourse*			Age (years) first pregnancy**		
	N	Median	95% ACI	N	Median	95% ACI
Villagers	131	19	19-20	126	20	20-21
Health officials	24	23	21-24	24	24	23-25
Teachers	139	23	22-23	132	24	24
Nurses	4	24.5	18-27	4	26	18-30
Total	298	21	21-22	286	23	23-24

*Villagers vs. health officials; villagers vs. Teachers ($p<0.001$) **Villagers vs. health officials; villagers vs. teachers ($p<0.001$).

Table 4. Wife's Suspicion that Husband has been Going to Commercial Sex Workers

Frequency	Villagers		Health officials		Teachers		Nurses		Total	
	N	%	N	%	N	%	N	%	N	%
Never	62	47.7	12	50.0	62	44.3	2	50.0	138	46.3
<1x/month	17	13.1	0	0	11	7.8	0	0	28	9.4
1x/month or more	15	11.5	2	8.3	11	7.8	0	0	28	9.4
Don't know	36	27.7	10	41.7	56	40.0	2	50.0	104	34.9

Table 5. Services before Attending Cervical Cancer Screening and Location of Screening

	Villagers		Health officials		Teachers		Nurses		Total	
	N	%	N	%	N	%	N	%	N	%
Total	149	100	23	100	139	100	36	100	347	100
Attended before	79	53.0	16	69.5	107	77.0	3	8.3	205	59.1
Health centre	19	24.0	2	12.5	0	0	0	0	21	10.2
Clinic	1	1.3	4	25.0	32	29.9	0	0	37	18.1
District hospital	27	34.2	3	18.7	10	9.4	1	33.3	41	20.0
Provincial hospital	8	10.1	4	25.0	35	32.7	1	33.3	48	23.4
Mobile clinic	24	30.4	3	18.7	30	28.0	1	33.3	58	28.3

cancer. An equally large proportion of villagers were screened in health centres, district hospitals and through mobile clinics. Teachers, being the only group with a higher educational background, seem to prefer ambulatory clinics and provincial hospitals for screening. Mobile clinics also seem to reach primary school teachers in the rural areas.

The grade of the females' acceptance of and satisfaction with the Kato device is given in Table 6. Except of the group of nurses, all groups of females considered (more than 90%) the insertion of the device as convenient. Only 13 to 14% from the groups of villagers and teachers experienced some pain when using the device. The proportion was greater in the group of nurses. Most of the women did not consider the device as harmful. A larger proportion of health officials, teachers and nurses, as compared to the villagers, were suspicious of the device and thought it might carry the risk of infection. Almost 95% of the villagers did not think there is any risk in using the device, while at least 10% of the teachers thought that there might be a risk. A similar trend can be observed for the group of health officials and nurses when compared to the teachers. Also, some women in these two groups suspect that it might be possible to get an infection

Table 6. Acceptance of and Satisfaction with the Kato Device

	Villagers		Health officials		Teachers		Nurses		Total	
	N	%	N	%	N	%	N	%	N	%
Inserting										
Inconvenient	11	7.3	0	0	10	7.1	7	20.0	28	8.0
Convenient	139	92.7	24	100	131	92.9	28	80.0	322	92.0
Feeling pain										
No	128	85.9	22	95.6	122	86.5	25	71.4	297	85.3
Yes	21	14.1	1	4.4	19	13.5	10	28.6	51	14.7
Device is harmful										
No	142	94.7	20	87.0	124	89.2	30	88.2	316	91.3
Yes	8	5.3	3	13.0	15	10.8	4	11.8	30	8.7
Risk of infection										
No	138	92.0	16	69.6	107	75.9	26	76.5	287	82.5
Yes	12	8.0	7	30.4	34	24.1	8	23.5	61	17.5
Satisfaction										
Very unsatisfied	1	0.7	0	0	2	1.4	0	0	3	0.8
Unsatisfied	0	0	0	0	0	0	1	2.9	1	0.3
Neutral	8	5.3	1	4.2	6	4.2	1	2.9	16	4.6
Satisfied	75	50.0	11	45.8	63	44.1	20	57.1	169	48.0
Very satisfied	66	44.0	12	50.0	72	50.3	13	37.1	163	46.3

from using the device. In the final analysis, it was found that an overwhelming majority of females were nevertheless satisfied or very satisfied with the device.

When comparing the use of the Kato device to the screening procedures undertaken by medical doctors, the Kato device was more favoured by the women. Most of the women found this method of screening more convenient and less painful (Table 7). The opinion on the safety and correctness of the device differs between the groups. Over 60% of the villagers considered the device to be safe, but over 50% of teachers are of the opinion that it might be safer to be screened by a doctor. The female villagers could not decide between the Kato device and the medical doctor as to which would come up with a more correct screening result. Fifty percent tended to favour the device, which another 50% tended to favour the medical doctor. A larger proportion of health officials, teachers and nurses believed the screening procedures undertaken by a doctor to be more correct in achieving a valid result than the Kato device. A major proportion of the women said that they would choose the Kato device again for screening, if it is available the next time. The proportion of villagers willing to use the Kato device again the next time (almost 85%) was higher than that of the teachers. In the latter, only 75% said they favoured using the Kato device again the next time. A similar trend of response to the Kato device, as for the teachers, was observed for the groups of health officials and nurses.

The specimens obtained from the device seem to be of good quality because it posed no problems for further examinations. The quantities of cells were above average for over 85% of samples from the villagers and for more than 90% from the other groups. Also, the stained quality of the cells was good (Table 8). In 5 from 348 samples abnormal cells were detected.

Discussion

Cervical cancer is one of the cancer sites, besides liver-, lung-, oral-, and breast cancer, mentioned in an initiative to control cancer nationwide in Thailand. The most appropriate measure to control cervical cancer is by screening. This would reduce the poor survival and high

Table 7. Comparing Screening Performed with the Kato Device and by a Medical Doctor

	Villagers		Health officials		Teachers		Nurses		Total	
	N	%	N	%	N	%	N	%	N	%
More convenient										
Kato device	84	94.4	13	81.3	86	80.4	23	85.2	206	86.2
Medical doctor	5	5.6	3	18.7	21	19.6	4	14.8	33	13.8
Greater safety										
Kato device	54	62.1	8	50.0	50	47.6	18	66.7	130	55.3
Medical doctor	33	37.9	8	50.0	55	52.4	9	33.3	105	44.7
Higher correctness										
Kato device	45	50.0	6	37.5	40	37.7	9	37.5	100	42.4
Medical doctor	45	50.0	10	62.5	66	62.3	15	62.5	136	57.6
Experience more pain										
Kato device	72	80.0	12	75.0	88	82.2	22	88.0	194	81.5
Medical doctor	18	20.0	4	25.0	19	17.8	3	12.0	44	18.5
Choose for next examination										
Kato device	123	84.8	15	62.5	105	74.5	28	80.0	271	78.6
Medical doctor	22	15.2	9	37.5	36	25.5	7	20.0	74	21.4

Table 8. Laboratory Results Obtained by Screening with Kato Device

	Villagers		Health officials		Teachers		Nurses		Total	
	N	%	N	%	N	%	N	%	N	%
Quantity of cells										
Above average	131	87.3	23	95.8	130	90.9	35	97.2	319	90.4
Stained quality of cells										
Very good	128	85.3	22	91.7	124	86.7	33	91.7	307	87.0
Categorisation of cells										
Normal	115	76.6	17	70.8	112	78.3	31	86.1	275	77.9
Benign change	34	22.7	7	29.2	27	18.9	5	13.9	73	20.7
Abnormal	1	0.7	0	0	4	2.8	0	0	5	1.4

mortality rates resulting from the fact that a high proportion of females only turn up for treatment when the disease is already in a very advanced stage. Early detection would improve the situation (Vatanasapt et al., 2002). Due to limited resources of the health sector, especially health manpower outside the main urban centres, the females who could be screened for cervical cancer by the Pap smear is still too low. From 1.199 females in the Nampong district, Khon Kaen province, age 20 years and above, 33.1% of them have never had a Pap smear test before, and the remaining 66.9% reported to have only one. (Kritpetcharat et al., 2003). Given the fact that the district Nampong can be considered a semi urban area and that in far away rural areas the situation might be even worse, and that cervical cancer screening should be done on a regular basis, it can be assumed that before cervical cancer can be efficiently controlled in Thailand, major improvements in screening the female population have to be made.

Attempts have been made to test methods to provide screening services to women living in the rural areas, for instance by screening women in the rural areas through mobile teams (Swaddiwudhipong et al., 1999). Recently, the results of a project were reported, in which 6.000 females were screened through teams based in village health centres and hospitals over a three-month period in the Roi-et province Northeast Thailand (Gaffikin et al., 2003). The method applied was a combination of visual inspection of the cervix with acetic acid wash (VIA) and cryotherapy in cases of pathological findings. The authors considered this approach to be safe, acceptable and feasible for the rural areas in Thailand.

A method which would not necessitate sending medical staff to the periphery, and which would allow mass screening on a large scale and in repeated intervals to be carried out, would be the introduction of a self-administered device. Such a device, the so-called Kato method, has been tested in Northeast Thailand previously (Pengsaa et al., 1997). Acceptance of the device was good. When testing the result obtained against the conventional Pap smear performed by a gynaecologist, the sensitivity to detect cells suspect for malignancy was 100%, the specificity 99.6% and the positive predictive value 84.6%. The device was not as good for detecting inflammatory changes of the cervix.

The objective of this present survey was to test the acceptance of the device by females with different educational backgrounds. Seventy percent of the females from the villages completed only primary school, while the other groups of females have had a college education or are holders of at least a bachelor degree. As for a mass campaign, only volunteers participated in this survey. As observed in the previous survey, acceptance of the device by the women was generally good. However, a larger proportion of women with a higher educational background were somehow more sceptical towards the device than their counterparts from the villages. Almost all the women who used the device were satisfied or very satisfied with it. But the females with a higher educational background were more suspicious of the device and thought that it might be harmful to use it or that it might carry the risk of infection. A greater proportion of women with a higher educational background tend to put their trust more on a Pap smear test done by medical doctors and many of them would prefer to be screened by a doctor again the next time. From the results of this survey and the one before (Pengsaa et al., 1997), it might be concluded that the use of the Kato device is justified in situations where resources for mass screening with the conventional Pap smear is limited. Efforts have to be made to lower the suspicions of the females from thinking the device to be unsafe or inaccurate. Especially the females with a higher educational background must be convinced of the usefulness and safety of the device, if the intention is to integrate them into a scheme where the Kato device is used. It seems that, especially women in the villages could be persuaded to volunteer for mass screening using the device. Suitable health facilities to help distribute the device to women in villages might be the health centres and district hospitals. Women with higher educational backgrounds might be approached more effectively through private clinics and provincial hospitals.

Some of the factors related to a higher risk of females developing cervical cancer were especially found in the females from the villages. Compared to the women with a higher educational background, the women from the villages experienced their first intercourse, marriage and first pregnancy at a much earlier age. One risk factor, which needs special attention, in an attempt not only to concentrate on secondary but also on primary prevention, is the role played by male partners and husbands. Oncogenic human papilloma virus could be transmitted by the males to their wives, if the males have been having unprotected intercourse with commercial sex workers previously (Thomas et al., 1996; 2001). At least 25% of the females from the villages admitted to believing that their husbands have been going to commercial sex workers. Women with higher educational backgrounds seem to be less open in voicing their suspicions on the question of whether their husbands have been going to commercial sex workers and having intercourse with these workers.

It was observed that to have some sort of screening program is better than not having any at all, since the mortality rate might be reduced by 58%. Costs per year of lives saved ranged from 121 USD to 6.720 USD. For the above mentioned approach, i.e. VIA conducted at 5-year intervals for women aged 35 to 55 years and for immediate treatment if the results of the tests turn out to be positive, will cost 517 USD per year of lives saved (Mandelblatt et al., 2002). It might be assumed that by using the Kato device, similar favourable results could be achieved to probably even lower costs, since there is no need to send health staff to the villages for a long time, and routine screening measures using the device would be easier to organise.

A suitable approach to strengthen the control of cervical cancer in the rural areas of Thailand might be to introduce the Kato device as an integral part of primary health care.

Females have to be trained on how to use of the device and they have to be convinced that the device is safe and acceptable as a tool for screening. At the same time, the distribution and collection of the device has to be organised. Suitable laboratories should be provided and enough cytotechnologists available to check the slides of smear samples obtained from the device. The introduction of the device should go along with health education on the importance of avoiding infection with the papilloma viruses. This message should be transmitted both to females and males.

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